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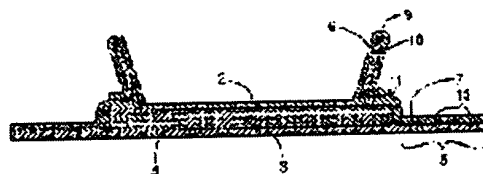
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## (54) DISPOSABLE DIAPER

(57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a structure capable of maintaining original absorbing performance of an absorber without getting out of shape even in any movement and a state of a wearer in the absorber arranged inside a three-dimensional gather by arranging a second absorber inside the three-dimensional gather.

**SOLUTION:** A disposable diaper is basically formed of a liquid permeable surface sheet 2, a liquid impermeable reverse sheet 3, a first absorber 4 arranged between both sheets 2, 3, a three-dimensional gather 6 arranged in the vicinity of both side edges and a side flap 5 extending outside from both side edges of the first absorber 4. The three-dimensional gather 6 is formed by arranging an elastic member 9 in a folding-back part by folding back both side edge parts of the surface sheet 2, a second absorber 10 is arranged inside, and a standing-up point is formed in both side edge parts on the first absorber 4. The side flap 5 is formed of a reverse sheet 3 part extending from both side edges of the first absorber 4 and a side sheet 7 laminated and arranged on this part.



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CLAIMS

[Claim(s)]

[Claim 1] The disposable diaper characterized by arranging the 2nd absorber inside said solid gathers in the disposable diaper which has the solid gathers arranged along with a longitudinal direction [ near the longitudinal direction edges on both sides of the surface sheet of liquid permeability, the rear-face sheet of liquid impermeability, the 1st absorber arranged among both / these / sheets, and said 1st absorber ].

[Claim 2] The disposable diaper according to claim 1 characterized by for the 2nd absorber arranged inside said solid gathers carrying out adhesion immobilization of the absorbent on a \*\*\*\*\* sheet, and forming it in the shape of a sheet.

[Claim 3] The disposable diaper according to claim 1 characterized by wrapping in an absorbent, making saccate that by which the 2nd absorber arranged inside said solid gathers carried out adhesion immobilization, and formed the absorbent in the shape of a sheet on the liquid permeability sheet, and being formed.

[Claim 4] The disposable diaper according to claim 1 characterized by being arranged so that the 2nd absorber arranged inside said solid gathers may wrap in an absorbent between the bags which consist of a liquid permeability sheet and a liquid impermeable sheet, and may be formed and said liquid impermeable sheet may be located in the lateral surface of solid gathers.

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the disposable diaper used as the object for sucklings, the object for adults, the object for incontinentia persons, an object for \*\*\*\*\* material, etc. This invention relates to the disposable diaper which prevented the horizontal leakage of excrement also to the motion and condition like a wearer throat in more detail.

[0002]

[Description of the Prior Art] The disposable diaper consists the absorber which consists of a curdy pulp and superabsorbency polymer, a hydrophilic sheet, etc. between the surface sheet of liquid permeability, and the rear-face sheet of \*\*\*\* moisture permeability of a monolayer or a configuration which has arranged solid gathers near the longitudinal direction edges on both sides of an absorber further by arranging two or more layers. Since it comes to use a superabsorbency polymer into the absorber of a disposable diaper in recent years, great effectiveness will be raised to leakage of urine, sweat, other body fluid, etc., or reversionary control. However, compared with curdy pulp, the urinary rate of absorption of a superabsorbency polymer is extremely slow, and when urine and body fluid are excreted, it may stagnate on a surface sheet temporarily, or may flow into a flank, may wet solid gathers, and may produce the leakage from width exceeding solid gathers further. For this reason, a cure which does not leak to a lot of urine at the time of carrying out long duration use of the disposable diaper and body fluid has been needed.

[0003] In order to solve the problem of these leakage, in the disposable diaper which consists of a surface sheet, a rear-face sheet, and an absorber that intervenes among both [ these ] sheets, it is a well-known technique to prepare the solid gathers of the pair which stands up from the side flap and side flap top face of the pair which extends from the longitudinal direction side edge of an absorber. Moreover, the absorber which prepared the body fluid with which the technique of forming an absorber in the interior of these solid gathers flows in a longitudinal direction from on an absorber by being well-known and using this technique by U.S. Pat. No. 4,695,278 in solid gathers can absorb. and horizontal leakage can be prevented.

[0004] However, the material of the solid gathers by said well-known technique is a permeable sheet, from having structure which covers an absorber with this permeable sheet, in the case of a lot of urine or body fluid, it cannot fully be absorbed, reaches to the rim part of a diaper, and cannot fully prevent the horizontal leakage of urine, body fluid, etc. only with the absorber of solid gathers. In order to solve this problem, while forming an absorber in solid gathers, in JP,5-9525,U, the technique which uses the outside of solid gathers as an impermeability sheet is indicated. Moreover, JP,8-56984,A arranges body fluid \*\*\*\*\* of an soft-elastic ingredient near the solid gathers, and is indicating the urine which flows in a longitudinal direction, and the technique which prevents the outward leak of body fluid. Horizontal leakage can be dammed up even when there is elimination of a lot of urine and body fluid according to this technique.

[0005]

[Problem(s) to be Solved by the Invention] Although sufficient absorptive power is maintained with the structure which used the outside of solid gathers as the impermeability sheet like said conventional technique when wearing in the static condition comparatively, a newborn infant and, in the case of the wearer accompanied by an intense motion, it may get twisted in the absorber inside solid gathers, and it may be unable to demonstrate the absorption function of \*\*\*\* injury student \*\* and the absorber which it originally has. Moreover, it bends by several places. without an soft-elastic ingredient drawing a smooth curve, if it is wear and \*\*\*\*\* is incurvate along with the circumference of length from the crotch to the cuff or a foot in the goods which constituted \*\*\*\*\* from an soft-elastic ingredient near the solid gathers, and the big wrinkling prolong crosswise [ of \*\*\*\*\* ] will occur, a slot will be form in the part stick to a wearer skin, and the problem of body fluid leaking from there and becoming easy to take out arises.

[0006] The purpose of this invention solves the trouble which the above-mentioned conventional disposable diaper has, and offers the disposable diaper which the absorber arranged inside solid gathers does not produce mold collapse in the motion or condition like a wearer throat. and has the structure where the absorptivity ability of absorber original is maintainable. That is, the absorber arranged in solid gathers can follow a motion of a wearer's body, can maintain an absorber configuration, and is to offer the disposable diaper which can carry out absorption maintenance of the excrement which flowed the surface sheet top into the longitudinal direction certainly.

[0007]

[Means for Solving the Problem] This invention for solving the above-mentioned technical problem includes the following invention.

(1) The disposable diaper characterized by arranging the 2nd absorber inside said solid gathers in the disposable diaper which has the solid gathers arranged along with a longitudinal direction [ near the longitudinal direction edges on both sides of the surface sheet of liquid permeability. the rear-face sheet of liquid impermeability, the 1st absorber arranged among both / these / sheets, and said 1st absorber ].

[0008] (2) A disposable diaper given in the preceding clause (1) characterized by for the 2nd absorber arranged inside said solid gathers carrying out adhesion immobilization of the absorbent on a \*\*\*\*\* sheet, and forming it in the shape of a sheet.

[0009] (3) A disposable diaper given in the preceding clause (1) characterized by wrapping in an absorbent, making saccate that by which the 2nd absorber arranged inside said solid gathers carried out adhesion immobilization, and formed the absorbent in the shape of a sheet on the liquid permeability sheet, and being formed.

[0010] (4) A disposable diaper given in the preceding clause (1) characterized by being arranged so that the 2nd absorber arranged inside said solid gathers may wrap in an absorbent between the bags which consist of a liquid permeability sheet and a liquid impermeable sheet. and may be formed and said liquid impermeable sheet may be located in the outside of solid gathers.

[0011]

[Embodiment of the Invention] The solid gathers arranged near the longitudinal direction edges-on-both-sides section of the 1st absorber arrange the 2nd absorber to the interior, and the disposable diaper of this invention is formed. Since absorption maintenance is carried out by the 2nd absorber inside solid gathers when excrement flows a surface sheet top into a longitudinal direction, the disposable diaper of this invention which has such a configuration can prevent that excrement begins to leak from the longitudinal direction of a diaper.

[0012] In this case, the thing which carried out adhesion immobilization and formed the absorbent in the shape of a sheet on the liquid impermeable sheet as the 2nd absorber, or to the thing and pan which were formed in saccate, \*\* which carried out adhesion immobilization on the liquid permeability sheet, and made the absorbent the shape of a sheet By using that which was changed into the condition of having wrapped in the absorbent between the bags which consist of a liquid permeability sheet and a liquid impermeable sheet The flattery nature of an absorber to a motion of a wearer becomes good, and the mold collapse or destruction of an absorber accompanying a motion of a wearer is prevented. It becomes possible to maintain the absorptivity ability which the absorber itself has, and further, since leakage \*\*\*\* of an absorbent is prevented, while preventing the horizontal leakage of excrement, the disposable diaper which can be used comfortably can be obtained.

[0013] Hereafter, although a drawing explains the disposable diaper of this invention to a detail, this invention is not limited to these. Drawing 1 is the flat-surface development view showing the condition of having developed the disposable diaper of this invention to the plane. In drawing 1, the side flap 5 to which the solid gathers 6 are arranged along with the longitudinal direction [ near the longitudinal direction edges on both sides of the 1st absorber 4 ], and the disposable diaper 1 extends outside from the edges on both sides of the 1st absorber 4 is formed. furthermore, a waist gathers elastic member arranges to the circumference of the waist at the order body time -- having -- later self -- the FASUNINGU tape 8 is attached in the circumference flank of the waist at the time.

[0014] Drawing 2 is the sectional view showing the condition of having cut the disposable diaper 1 of drawing 1 along with X-X-ray. In drawing 2, the disposable diaper is fundamentally formed from the side flap 5 which \*\*\*\* outside from the surface sheet 2 of liquid permeability. the rear-face sheet 3 of liquid impermeability, the 1st absorber 4 arranged among both [ these ] sheets, the solid gathers 6 arranged near the edges on both sides of the 1st absorber 4, and the edges on both sides of the 1st absorber 4. In this case, the solid gathers 6 turn up the edges-on-both-sides section of the surface sheet 2, arrange an elastic member 9 into a clinch part, and are formed in it, the 2nd absorber 10 is arranged inside the solid gathers 6, and the standing up point is further formed in the edges-on-both-sides section on the 1st absorber 4. Moreover, the side flap 5 is formed on this of the sideseat 7 by which laminating arrangement was carried out with rear-face sheet 3 part which \*\*\*\* from the edges on both sides of the 1st absorber 4, and both sheets are joined by the junction line 13.

[0015] In addition, in drawing 2, although the solid gathers 6 are formed with the surface sheet 2, they may be formed using the ingredient of a sideseat 7 or others, and a standing up point may also be not on the absorber 4 but on the side flap 5. Furthermore, by drawing 2, although the solid gathers 6 turned to the outside of a diaper and have stood up, the inside of a diaper may be turned to, and they may stand up it, or may stand up straightly. Moreover, although drawing 2 showed the example which does not arrange the elastic member which forms the circumference gathers of a foot between the rear-face sheet 3 which forms the side flap 5, and a sideseat 7, an elastic member may be arranged among both sheets if needed.

[0016] Drawing 3 is the sectional view which expanded the part of the solid gathers 6 of the disposable diaper shown in drawing 2. In drawing 3, the solid gathers 6 turn up the side edge section of the surface sheet 2, and are formed, and the 2nd absorber 10 is arranged inside the turned-up part. In this case, the 2nd absorber 10 carries out adhesion immobilization of the absorbent which consists of a superabsorbency polymer 16 and curdy pulp 17 on the liquid impermeable sheet 15, and is formed in the shape of a sheet, it is arranged inside the clinch part of the surface sheet 2 so that an absorbent may face inside a diaper, and the liquid impermeable sheet 15 and the surface sheet 2 are joined by the junction line 18.

[0017] Drawing 4 is a sectional view in which drawing 3 shows a different example and which expanded the part of the solid gathers 6 of the disposable diaper shown in drawing 2. In drawing 4, the solid gathers 6 turn up the side edge section of the surface sheet 2, and are formed, and the 2nd absorber 10 is arranged inside the turned-up part. In this case, carry out adhesion immobilization of the absorbent which consists of a superabsorbency polymer 16 and curdy pulp 17 on the liquid permeability sheet 14, and form in the shape of a sheet, and subsequently, wrap in an absorbent, it is formed by making the 2nd absorber 10 saccate, and the liquid permeability sheet 14 and the surface sheet 2 are joined by the adhesion lines 12 and 18. Moreover, the side edge of the surface sheet 2 which forms the solid gathers 6 is joined by the side edge and the junction line 11 of a sideseat 7. In addition, adhesion immobilization of the all does not have to be carried out at the liquid permeability sheet 14, and the absorbent may be partially arranged in the shape of a layer.

[0018] Drawing 5 is a sectional view in which drawing 3 and drawing 4 show a different example and which expanded the part of the solid gathers 6 of the disposable diaper shown in drawing 2. In drawing 5, the solid gathers 6 turn up the side edge section of the surface sheet 2, and are formed, and the 2nd absorber 10 is arranged inside the turned-up part. In this case, between the bags which joined and formed a part for the both ends of the liquid permeability sheet 14 and the liquid impermeable sheet 15, the 2nd absorber 10 wraps in the absorbent which consists of a superabsorbency polymer 16 and curdy pulp 17, on the front face of the liquid impermeable sheet 15, carries out adhesion immobilization of the absorbent, and is formed. Here, no absorbents need to be fixed and it may be partially arranged in the shape of a layer. Moreover, the liquid permeability sheet 14 and the surface sheet 2 are joined by the junction line 12, and the liquid impermeable sheet 15 and the surface sheet 2 are further joined by the junction line 18. Moreover, the side edge of the surface sheet 2 which forms the solid gathers 6 is joined by the side edge and the junction line 11 of a sideseat 7.

[0019] The nonwoven fabric with which the surface sheet used in this invention consists of polyethylene, polypropylene, other thermoplastic fiber, etc., textile fabrics, porous plastic film, porous form, reticulated form, etc. are used. Moreover, anyway, although natural fibers (for example, woody fiber, curdy fiber, etc.) are sufficient and it can manufacture from the ingredient of large range, such as combination of a synthetic fiber and a natural fiber, further, since a surface sheet is a part in contact with the direct skin, it is soft and the touch should be just good [ a sheet ]. Moreover, that by which hydrophilization processing was performed to the surface sheet when the material property was water repellence is used.

[0020] In this invention, the sheet of liquid impermeability which consists of polyethylene etc. is used as a rear-face sheet. When a sheet with the moisture permeability which added the filler at the sheet made from plastics which prepared much micropores of extent which pass a steam, and thermoplastics, and was extended although especially the liquid was not passed, or the compound sheet which made the nonwoven fabric rival on the outside of these sheets is used, since the moisture of the diaper inside is emitted outside, it is steamed and \*\* or blurring is prevented, it is desirable.

[0021] In this invention, although the nonwoven fabric which consists of polyethylene, polypropylene, polyester, or a synthetic fiber that

used other thermoplastics as the raw material as a side-seal can be used, as for the nonwoven fabric used for a side-seal, it is desirable that it is water repellent. Moreover, you may be the sheet of liquid impermeability which made the film which becomes this nonwoven fabric from thermoplastics rival.

[0022] In curdy pulp, what used the superabsorbency polymer together to the principal member is desirable, in addition, as for the 1st absorber used in this invention, mixture and laminated material, such as absorbent-paper independence or heat welding fiber, are used. Moreover, it is good also as a laminated structure which wrapped the whole in tissue. Although a sandglass mold, a rectangle, etc. are sufficient as the configuration of the 1st absorber, fit nature with the better sandglass mold is obtained.

[0023] A thing with a fiber length of 5mm or less obtained as curdy pulp by \*\*\*\*(ing) sheets, such as chemical pulp, mechanical pulp, and recycled pulp, with a fibrillated film machine is used. As a pulp raw material, straw, a bamboo, a kenaf, a bagasse, etc. can be used other than a needle-leaf tree or a broad-leaved tree, although it differs by whether the amount of the pulp used is used with the absorber made into the purpose, for example, independent, or it is used, carrying out two or more laminations, or other absorbers are used together -- general -- 50 - 400 g/m<sup>2</sup> it is. Moreover, a synthetic fiber, the heat welding matter, adhesives, etc. may be used together with curdy pulp.

[0024] As a superabsorbency polymer, a starch system, a cellulose system, and a synthetic polymer system are mentioned. Namely, the saponification object of a starch acrylic-acid (salt) graft copolymer and a starch ethyl-acrylate graft copolymer. The saponification object of a starch methyl-methacrylate graft copolymer, the saponification object of a starch acrylonitrile graft copolymer. The saponification object of a starch acrylamide graft copolymer, the saponification object of a starch acrylonitrile 2-acrylamide 2-methyl propane sulfonic-acid graft copolymer. They are the polyethylene oxide over which the bridge was constructed with the acrylic-acid (salt) polymer and the acrylic acid, the bridge formation object of a sodium carboxymethyl cellulose, the bridge formation object of a polyvinyl alcohol maleic-anhydride reactant, etc. Although such absorbance has some which absorb the urine of 20 times or more of a self-weight, body fluid, and water, the sodium polyacrylate system of the synthetic-resin system which has the absorbance of 50 times or more of a self-weight preferably is suitable. These superabsorbency polymers may be used independently and may be used combining two or more sorts. moreover, a superabsorbency polymer -- complications -- it may be granular or fibrous and especially the magnitude is not limited.

[0025] The 2nd absorber used in this invention makes saccate the sheet which carried out adhesion immobilization of the sheet which carried out adhesion immobilization and formed the absorbent in the liquid impermeable sheet, or the absorbent at the liquid permeability sheet, and is formed. As an absorbent, although the above-mentioned superabsorbency polymer is used advantageously, curdy pulp and other absorptivity ingredients can also be used together if needed. Moreover, the sheet of a hydrophilic property used for forming the above-mentioned surface sheet as a liquid permeability sheet can be used. Furthermore, the thing which carried out water-repellent treatment of the sheet used for forming the above-mentioned surface sheet as a liquid impermeable sheet, or the sheet used for forming the above-mentioned rear-face sheet can be used.

[0026] Especially the approach of fixing an absorbent to a liquid permeability sheet or a liquid impermeable sheet is not limited, and can use a well-known approach conventionally. For example, the approach using adhesives or thermoplastics can be made to be able to intervene, thermocompression bonding can be carried out at the temperature more than the softening temperature of this resin, and the approach of fixing by melting of resin etc. can be used.

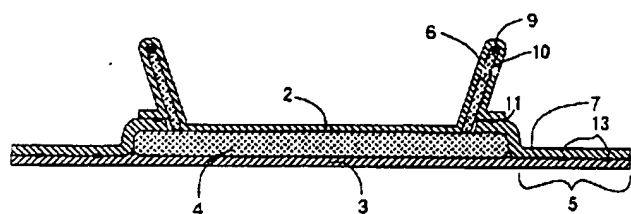
[0027] Moreover, in this invention, the approach of pasting up with hot melt adhesive is advantageously used as an approach of joining sheet surfaces or a sheet surface, an absorber, etc. As long as a bead, a spiral, a melt blow, etc. are the approaches generally used, any are sufficient as it, but in order for the aesthetic property of the sheet after sticking to be good, there is little method of application of hot melt adhesive in the possible range about the amount of the adhesives used, and homogeneity or applying intermittently are desirable all over a plane of composition.

[0028]

[Effect of the Invention] What the disposable diaper of this invention carried out adhesion immobilization of the absorbent on the liquid impermeable sheet as an absorber arranged inside solid gathers, and was made into the shape of a sheet, or to the thing and pan which were further used as the bag-like object, what carried out adhesion immobilization of the absorbent on the liquid permeability sheet, and was made into the shape of a sheet by [ which have arranged the absorbent between the bags which consist of a liquid permeability sheet and a liquid impermeable sheet ] using and using such an absorber The flattery nature of an absorber to a motion of a wearer becomes good, and the mold collapse or destruction of an absorber accompanying a motion of a wearer is prevented. It becomes possible to maintain the absorptivity ability which the absorber itself has, and further, since leakage \*\*\*\* of an absorbent is prevented, it excels in the horizontal leakage prevention effectiveness of excrement, and can be used still more comfortably.

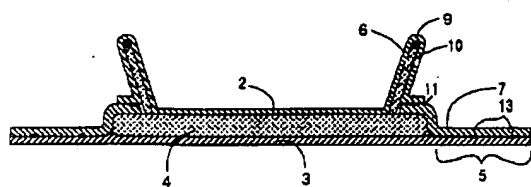
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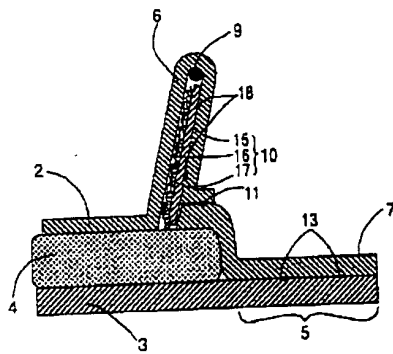
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Drawing selection drawing 2



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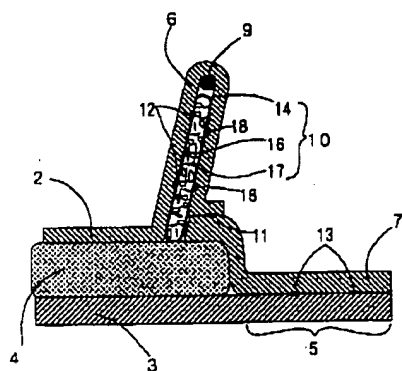
Drawing selection drawing 3



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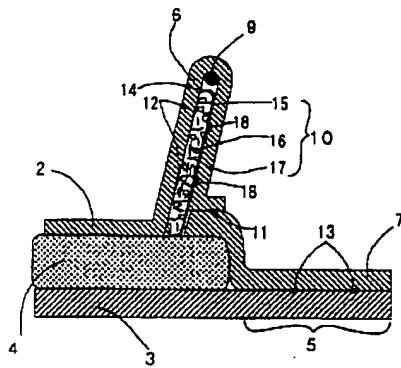


Drawing selection **drawing 4**



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Drawing selection drawing 5



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